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SPECIFICATION

ELECTRICAL CONNECTOR HAVING CONTACT WITH PRE-PRESSING STRUCTURE

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to an electrical connector, and more particularly to an electrical connector having a contact with pre-pressing structure.

2. Description of Related Art

[0002] Plug and jack type connectors are well known for use in connecting electrical equipments. A plug connector generally comprises a plug pin. A jack connector generally comprises a central contact having a resilient arm slantedly extending in a receiving space thereof. When the plug pin is inserted into the receiving space, the resilient arm of the central contact abuts against the plug pin to electrically connect the plug pin and the central contact. In order to increase the mating force between the plug pin and the resilient arm of the central contact for a reliable electrical connection therebetween, a method is provided to increase a length and a slope of the resilient arm. However, the increased resilient arm needs a large enough receiving space to accommodate it, which increases dimensions of the jack connector. In addition, the increased resilient arm adversely affects setting of other contacts of the jack connector.

[0003] A solution to the above problem is to provide a second contact which presses the resilient arm of the central contact before the plug pin is inserted into the receiving space of the jack connector. The additional second contact needs an additional separate mold to be manufactured, which will increase the cost of the

jack connector. Another solution is to provide a housing with a pressing structure used to pre-stress the resilient arm of the central contact before the plug pin is inserted into the receiving space of the jack connector. A disadvantage of this solution is that the pressing structure complicates the structure of the housing of the jack connector and the assembly procedure of the central contact.

[0004] Hence, an electrical connector having an improved pre-pressing structure is desired.

SUMMARY OF THE INVENTION

[0005] An object of the present invention is to provide an electrical connector having a contact with a pre-pressing structure which can reduce the dimensions of the electrical connector.

[0006] To achieve the above object, an electrical connector in accordance with the present invention comprises an insulative housing defining a receiving space and a passageway communicating with the receiving space, and an electrical contact received in the passageway of the insulative housing. The electrical contact comprises a body portion, a resilient arm having a contact portion projecting into the receiving space of the insulative housing and an extension extending from the contact portion, and a tab extending from the body portion and having a pressing portion pressing the extension of the resilient arm to deflect the resilient arm toward the body portion.

[0007] Other objects, advantages and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. 1 is an exploded perspective view of an electrical connector in accordance with the present invention;

[0009] FIG. 2 is a view similar to FIG. 1 but taken from a different aspect;

[0010] FIG. 3 is an assembled perspective view of the electrical connector of FIG. 1 but taken from a different aspect;

[0011] FIG. 4 is a cross-sectional view of the electrical connector taken along line 4-4 of FIG. 3;

[0012] FIG. 5 is a view similar to FIG. 4 but the electrical connector is mated with a complementary connector; and

[0013] FIG. 6 is a perspective view of a central contact in accordance with a second embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0014] Referring to FIGS. 1, 2 and 3, an electrical connector 1 in accordance with the present invention comprises an insulative housing 10, a plurality of electrical contacts 20, and a metallic shell 30.

[0015] The insulative housing 10 has a front face 11, a rear face 12 opposite to the front face 11, a top face 13, a bottom face 14 opposite to the top face 13, and two opposite side faces 15, 16. The insulative housing 10 is formed with a mating portion 110 extending forwardly from the front face 11. The mating portion 110 defines a receiving space 111 extending rearwardly through the insulative housing 10. The insulative housing 10 defines a top groove 130 in the top face 13 and a bottom groove 140 in the bottom face 14. A pair of projections 150 are formed on the front end of the side face 15 and a projection 160 is formed on the front end of

the side face 160. The insulative housing 10 defines a central passageway 120, a left passageway 121 and a right passageway 122. The central passageway 120 is located below the receiving space 111 and communicates with the receiving space 111. The left and the right passageways 121, 122 are located on the left and right of the receiving space 111 and communicate with the receiving space 111 respectively. A pair of guide posts 123 extend rearwardly from the rear face 120 of the insulative housing 10.

[0016] The electrical contacts 20 comprises a central contact 21, a stationary contact 22, a switching contact 23 and a signal contact 24. The central contact 21 is stamped and formed from a piece of metal and comprises an elongated body portion 210, a resilient arm 211 extending forwardly from a front end of the body portion 210, and tail portion 217 extending rearwardly from the body portion 210. The resilient arm 211 is stamped and formed with a curved contact portion 212 projecting downwardly and an extension 213 extending forwardly from the contact portion 212. Then the resilient arm 211 is bent upwardly and rearwardly at a sharp angle to the body portion 210. An opening 214 is punched in the body portion 210 along a longitudinal direction thereof and with a tab 215 extending from a front wall of the opening 214. The tab 215 is bent upwardly and forwardly and is formed with a pressing portion 216 on a distal end thereof. The pressing portion 216 presses the extension 213 of the resilient arm 211 and deflects the resilient arm 211 toward the body portion 210.

[0017] The contact 22 (23, 24) comprises a body portion 220 (230, 240), a contact arm 221 (231, 241) extending forwardly from the body portion 220 (230,240) and a tail portion 222 (232,242) extending rearwardly from the body portion 220 (230, 240). The contact arms 231, 241 are formed with contact portions 233, 243, respectively.

[0018] The metallic shell 30 comprises a top wall 31, a bottom wall 32

opposite to the top wall 31, two opposite side walls 33, 34 and a plurality of solder portions 311, 321 extending rearwardly from the top and the bottom walls 31, 32. The top and the bottom wall are formed and stamped with tabs 310, 320 respectively. The tabs 310, 320 extend inwardly and rearwardly. The side wall 33 defines a pair of gaps 330 on a front end thereof and the side wall 34 defines a gap 340 on a front end thereof.

[0019] In assembly, the contacts 21, 22, 23 and 24 are assembled to the insulative housing 10 from the rear face 12 of the insulative housing 10. The central contact 21 is received in the central passageway 120 with the contact portion 212 projecting into the receiving space 111. The stationary and the switching contacts 22, 23 are received in the right passageway 122 of the insulative housing 10 with the contact arm 221 abutting against the contact arm 231 and the contact portion 233 projecting into the receiving space 111. The signal contact 24 is received in the left passageway 121 of the insulative housing 10 with the contact portion 243 projecting into the receiving space 111. The tail portions 217, 222, 232, 242 of the contacts 21, 22, 23,24 extend rearwardly beyond the rear face 12 of the insulative housing 10. The metallic shell 30 encloses the insulative housing 10. The tabs 310, 320 abut against rear end walls of the grooves 130, 140 in the top and the bottom faces 13, 14 of the insulative housing 10 respectively to prevent the metallic shell 30 from moving rearwardly. The projections 150, 160 on the side faces 15, 16 of the insulative housing 10 engage with the gaps 330, 340 on the side walls 33, 34 of the metallic shell 30 to prevent the metallic shell 30 from moving forwardly. The solder portion 311, 321 extend rearwardly beyond the rear face 12 of the insulative housing 10.

[0020] Referring to FIGS. 4 and 5, when the electrical connector 1 is not mated with a complementary plug connector 40, the pressing portion 216 of the tab 215 presses the extension 13 of the resilient arm 211 and deflects the resilient arm

211 toward the body portion 210, thereby economizing space of the receiving space 111 and reducing the dimensions the electrical connector 1. When the electrical connector 1 is mated with the plug connector 40, a mating pin 41 of the plug connector 40 presses the contact portion 212 of the resilient arm 211 of the central contact 21 and further deflects the resilient arm 21. The extension 213 of the resilient arm 21 disengages from the pressing portion 216 of the tab 215. The contact portion 212 abuts against the mating pin 41 firmly, so a reliable electrical connection between the central contact 21 and the mating pin 41 is obtained.

[0021] Referring to FIG. 6, a central contact 21' in accordance with a second embodiment of the present invention is stamped and formed from a piece of metal and comprises an elongated body portion 210', a resilient arm 211' extending forwardly from a front end of the body portion 210', and a tail portion 217' extending rearwardly from the body portion 210'. The resilient arm 211' is stamped and formed with a curved contact portion 212' projecting downwardly and an extension 213' extending forwardly from the contact portion 212'. An opening 214' is punched in the body portion 210' along a longitudinal direction thereof and with a tab 215' extending upwardly from a rear wall of the opening 214'. Then the resilient arm 211' is bent upwardly and rearwardly at a sharp angle to the body portion 210'. A distal end of the tab 215' is bent forwardly to form a pressing portion 216'. The pressing portion 216' presses the extension 213' of the resilient arm 211' and deflects the resilient arm 211' toward the body portion 210'. The difference between the central contact 21 and 21' is that the tab 215 extends from the front end wall of the opening 214 but the tab 215' extends from the rear end wall of the opening 214'. Since the opening 214' is located under the resilient arm 211' and the tab 215', the body portion 210' can be reduced when needed.

[0022] It is to be understood, however, that even though numerous characteristics and advantages of the present invention have been set forth in the

foregoing description, together with details of the structure and function of the invention, the disclosure is illustrative only, and changes may be made in detail, especially in matters of shape, size, and arrangement of parts within the principles of the invention to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.